



I HEREBY CERTIFY THAT THIS CORRESPONDENCE IS BEING DEPOSITED WITH THE UNITED STATES POSTAL SERVICE AS FIRST CLASS MAIL IN AN ENVELOPE ADDRESSED TO: COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA 22313-1450, ON THE DATE INDICATED BELOW.

By: Ljiljana Dragic Date: October 11, 2005

**PATENT  
MAIL STOP AMENDMENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In Re Patent Application of:	:	
Dragan Sretenovic	:	
Conf. No.: 3667	:	Group Art Unit: 2142
Appln. No.: 09/709,916	:	Examiner: Thong H. Vu
Filing Date: November 9, 2000	:	Attorney Docket No.: 1521-190
Title:	:	
SYSTEM AND METHOD FOR COMMUNICATING, MONITORING AND CONFIGURING A DEVICE OPERATIVELY CONNECTED TO A NETWORK		

**DECLARATION OF PRIOR INVENTION IN THE UNITED STATES  
TO OVERCOME CITED PATENT UNDER 37 C.F.R. § 1.131**

**I, Dragan Sretenovic, declare and state that:**

1. I am the sole inventor of the subject matter of the claims of U.S. Patent Application No. 09/709,916 ("the present application").
2. Claims 10-26 of the present application currently stand rejected under 35 U.S.C. § 102(e) over U.S. Patent No. 6,772,216 (Ankireddipally *et al.*). Ankireddipally has an effective filing date of May 19, 2000.
3. In December 1998, I addressed the problem of monitoring devices that are newly added to a network by a network manager. Then current approaches for monitoring the devices required that information about the devices be maintained in the form of a linked library or in a module inside applications. I conceived of using XML technology for describing printers characteristics. The printer characteristics (definitions) could be stored in a file. The stored definitions could include message translations, thus making the definitions suitable for use by

generic applications for the dynamic creation of a graphical user interface (GUI) for print control and status. I prepared a written description of the concept on January 22, 1999 (see Exhibit A).

4. On February 1, 1999, I prepared an Invention Disclosure Form (Exhibit B) which expanded on the concept of January 22, 1999. In particular I described a solution to the monitoring newly installed printers in which the characteristics of every printer could be described in one file and that one file could be available on-line over the Internet. I described a process for obtaining the printer characteristics from any available source using available communication channels and generating a user interface GUI. I also described including in the printer file, translations of the printer characteristics into various national languages. The Invention Disclosure Form formed the basis of a prototype which I developed and demonstrated to Oki Data Americas, Inc. on August 4, 1999.

5. At the conclusion of the prototype demonstration, I prepared on August 16, 1999, an Invention Disclosure Form and submitted it to Oki Data Americas, Inc. (Exhibit C). The Invention Disclosure Form of August 16, 1999 describes a system which uses a data engine (NM) and a data dictionary (DC) for: (1) obtaining a description of a device newly connected to a network and (2) for presenting values of the device variables to a user using a graphical user interface.

6. On information and belief, a patentability search was initiated on October 28, 1999, based on the Disclosure Invention Form of August 16, 1999. On information and belief, a favorable patentability opinion was completed by a patent attorney on December 7, 1999.

7. On information and belief, a patent attorney was authorized to prepare a patent application on December 21, 1999, based on the Disclosure Invention Form of August 16, 1999.

8. On April 19, 2000 I updated the information in the Invention Disclosure Form of August 16, 1999 to include a more detailed description of the invention (Exhibit D). I included figures which are the bases of Figs. 1 and 2 of the present application.

9. Exhibits A-D, in combination, describe a computer system comprising a data engine, a plurality of data agents and a data dictionary where the data engine: (1) receives descriptions of devices and translating information from the data dictionary; (2) receives values of variables from a device via the data agents; and (3) translates the values of device variables into a human language for presentation to a user.

10. Exhibits A-D are documentary evidence of facts establishing conception of the

invention in December 1998 coupled with due diligence to the filing of U.S. Patent Application No. 09/709,916 on November 9, 2000.

.11. All of the above inventive acts were carried out by me in the United States during the period *before* May 19, 2000. Thus, I invented the subject matter of the claims in the present application *prior to* May 19, 2000, the filing date of Ankireddipally et al.

12. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Date: 10/10/05

Dragan Sretenovic  
Dragan Sretenovic

Enclosures: Exhibit A,  
Exhibit B,  
Exhibit C, and  
Exhibit D.

## XML for Printers

Author: Dragan Sretenovic, Software Engineering

Date: 1/22/99

This document is intended to present IDEA of using XML technology for printer support software. XML is latest development in Internet area, with very fast grow and applications in various areas.

XML stands for eXpandable Markup Language. Syntax of this language is similar to HTML, language for description of Web pages, because both of them are based on SGML, generalized language for defining other languages. Major difference is purpose: while HTML defines screen layout of Web pages along with data, **XML defines meaning of the data**, data structure.

Let's see one example of XML:

```
<company brandname="OKI">
  <name>Okidata</name>
  <address> 2000 Bishops Gate Blvd, Mt. Laurel </address>
  <product name="Okipage 8c">
    <speed value="8ppm"/>
    <driver name="ps"/>
    <driver name="pcl"/>
  </product>
</company>
```

### How XML can be used

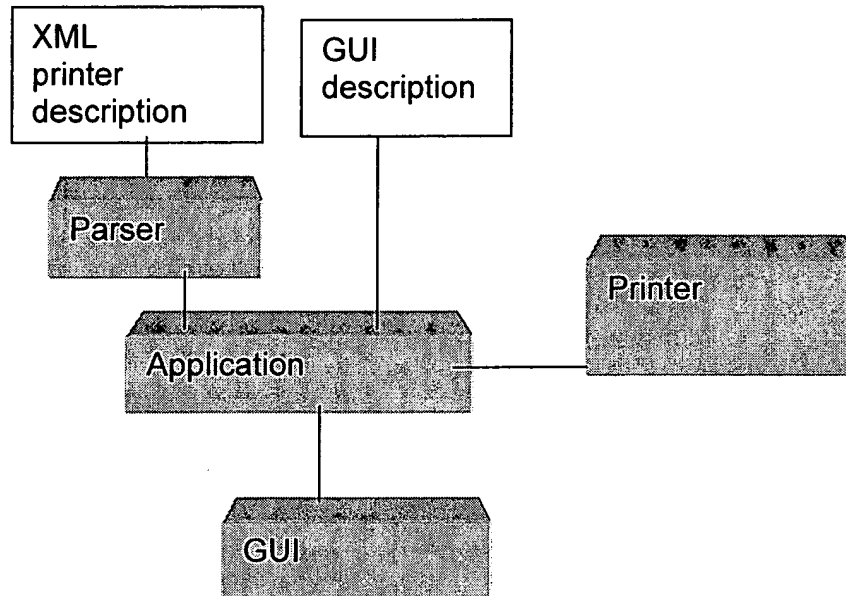
#### Proposed Project

- XML can be used for describing printer characteristics.
- This description can be used by generic applications for dynamic creation of GUI for print-control, like status monitor/ operator panel.
- The same description can be used for multiple types of application, including Windows and Web GUI, local and network monitoring, integration with other applications.
- Applications localization can be done by simple adding message translations inside printer definition.
- Printer definition can be stored in files, but also in printer firmware.

This approach has multiple strategic advantages for Okidata:

- This will allow much faster software development
- It will be base for Web GUI

- Same applications can be used for multiple printers.
- Localization becomes much faster, will not require changing software
- This will be first application of XML in printer industry and eventually can become base for standard.
- It is possible that parts of this project can be patented



# INVENTION DISCLOSURE FORM

*This form is for the reporting of any new idea which you think may be of technical or commercial use.*

## **A. Your name and address**

**Dragan Sretenovic**  
140-C Hamilton Road, Maple Shade, NJ 08052

## **B. Names of all other personnel who worked with you in developing the idea**

None.

## **C.1 Field to which the idea relates**

Printer support software. Printer description. Printer drivers. Dynamic GUI creation.

## **C.2 Problem which the idea is supposed to solve**

Currently, every printer requires separate driver and status monitor software. For every printer, a user has to install driver(s) and custom software, and when printer is changed, it is necessary to reinstall software.

## **C.3 Brief summary of the solution**

Characteristics of every printer can be described by one standard file, and based on this description generic software can communicate with printer and generate customized GUI.

This description can be [A]

- stored in printer firmware, and loaded by software
- distributed with printer software, and also
- available on-line (from Internet)

Description can be based on XML language, and because of this it will be expandable. This description can contain all printer characteristics, including PDL language commands, Printer MIB commands and any other characteristics that are usable for software.

Printer driver, status monitor, software operator panel or any other software that communicates with printer will first inquire printer for name/id, using available communication channels. Based on this, universal application will load printer definition from any available source described in [A], and generates user-interface GUI and all communication with the printer.

#### **C.4 Written description, in some detail, of a practical embodiment of the idea illustrated by and keyed to wiring diagrams and sketches appended.**

It is proposed to use XML as a base for printer description, because of its expandable nature. This description will include all printer characteristics, including but not limited to hardware characteristics and alternative ways to get and set printer status, PJJ commands, SNMP commands, PS commands or any other way.

Printer description also can include translated strings for various national languages. This can be used for multilingual versions of software. Application will first determine user-preferred language, and later display appropriate messages if available in printer description or in separate file with all translated messages.

#### **C.5 What further work should be done to perfect or improve the idea or develop competitive ideas.**

It is necessary to define printer definition XML data structure.  
It means defining XML language extension syntax.  
Based on this, particular printers should be described.

Generic software that will utilize this concept should be developed.

New printer firmware can be planed to allow storing of printer description, and command for reading of this description by software.

#### **C.6 Expected extent of use of the new idea**

It is possible that this principle will be adopted as a standard way of describing all printers, and that new-generation drivers, status monitors and other software will be generic and based on this idea.

#### **C.7 References**

**a) Identify all notebook entries of original reports made on the idea to date.**

None.

**b) List all publications or patents you know about illustrating relevant prior art.**

None known.

#### **D. General Information**

**a) When did the idea first occur to you and/or the other personnel listed in "B" above?**

Decembar 1, 1998.

**b) When were any sketches or drawings of the idea made and where are they now?**

1/22/99, file XMLforPR.doc  
Personal Engineering Notebook.

**c) Drawing numbers, if any**

None.

**d) When was the first written description of the idea (other than this record) made, and where is it now?**

1/22/99, file XMLforPR.doc

**e) If the first description of your idea was oral, to whom was it made, when, and where?**

Not oral.

**f) Has your idea ever been actually used or tested in any way?**

Yes:

No: X



**g) Has your idea, or any drawings, specifications, models, or equipment incorporating it, ever been sold or offered for sale?**

**Yes:**

**No: X**

**h) When was the idea first tested or demonstrated?**

NA

**i) Where?**

NA

**j) Who witnessed such test or demonstration?**

NA

**k) Where is the model that you tested?**

NA

**l) Attach photographs (if any) of the model**

NA

**Please sign and date this form below, and if possible, have two (2) witnesses who understand the idea also sign it as indicated. Do the same for each sheet attached to this form**

**Witness-1    Date**

Tim O'Shea, 2/1/1999

**Discloser    Date**

Dragan Sretenovic, 2/1/1999

**Witness-2    Date**

C.S.Murali, 2/1/1999

# INVENTION DISCLOSURE FORM

*This form is for the reporting of any new idea which you think may be of technical or commercial use.*

## **A. Your name and address**

**Dragan Sretenovic**  
140-C Hamilton Road, Maple Shade, NJ 08052

## **B. Names of all other personnel who worked with you in developing the idea**

None.

## **C.1 Field to which the idea relates**

Network Monitoring, SNMP, MIB  
Printer description, PJI  
Printer support software.  
Dynamic GUI creation.

## **C.2 Problem which the idea is supposed to solve**

Monitoring network devices involves two parties: Network Monitoring Application (NM) and Network Agent (NA). NA has interface to monitored device, and NM collects and presents data.

Both NM and NA have to have knowledge about monitored device. Problem is that current solutions require that knowledge locally stored in form of linked library or module inside applications, which prevents dynamic upgrades of system to allow monitoring new devices.

## **C.3 Brief summary of the solution**

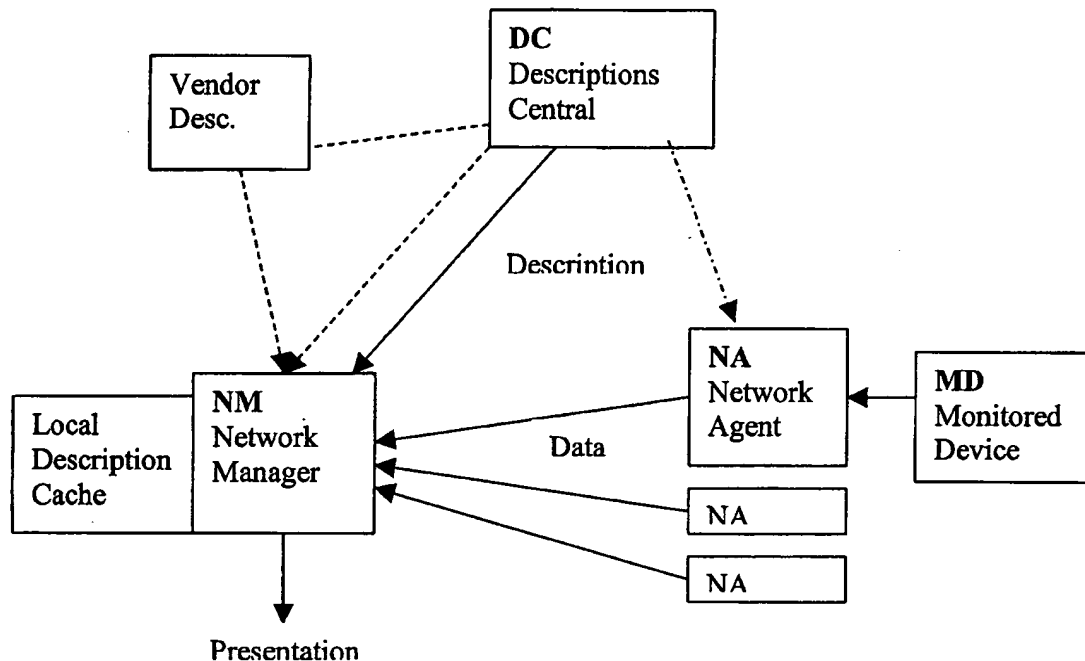
Information about monitored device can be stored on central place on network - Internet. Lets call this place: Descriptions Central (DC). This can be one WWW or FTP location on the Internet, with descriptions in XML, MIB, MIF or other format. It can also contain links to other locations in case that some vendors want to keep descriptions on its site.

When NM (or NA) detects new (unknown to it) device description, it can contact DC over network, and get appropriate descriptions. NM collects data from NA and descriptions from DC, and dynamically generates presentation (GUI).

In case of selection different human language for descriptions, generated GUI automatically becomes multilingual.

**C.4 Written description, in some detail, of a practical embodiment of the idea illustrated by and keyed to wiring diagrams and sketches appended.**

**SYSTEM DESIGN:**



**SCENARIO:**

1. NA gets data from MD (i.e. using PjL)
2. if device type is new for NA, NA gets new descriptions from DC
3. NM gets data from NA (i.e. using XML or SNMP)
4. if device type is new for NM, NM gets new descriptions from DC
5. NM generates presentation (i.e. GUI, HTML) by dynamically assembling data from NA with descriptions from DC

- To improve speed, NM and NA can store used descriptions locally in files or database
- DC can have descriptions or pointers (URL addresses) of descriptions stored on vendors sites

## **FORMAT OF MESSAGES:**

NA -> NM:

- a) SNMP
- b) XML over HTTP (or FTP or some other protocol)
- c) some other protocol

DC -> NM, NA

- A) ASN.1 over HTTP (or FTP or some other protocol)
- B) XML over HTTP (or FTP or some other protocol)
- C) Some other protocol

## **CONTENT OF MESSAGES:**

- SNMP OID & Value
- SNMP OID & Description
- PJJ Var.Name & Value
- PJJ Var.Name & Description

### **C.5 What further work should be done to perfect or improve the idea or develop competitive ideas.**

It is necessary to standardize description definition XML data structure (DTDs), and convert existing descriptions in new format.

Generic software that will utilize this concept should be developed.

New printer (or other device) firmware can be planed to allow storing of printer description, and command for reading of this description by software.

### **C.6 Expected extent of use of the new idea**

It is possible that this principle will be adopted as a standard way of describing all network devices, and that new-generation drivers, status monitors and other software will be generic and based on this idea.

### **C.7 References**

a) **Identify all notebook entries of original reports made on the idea to date.**

None.

- b) List all publications or patents you know about illustrating relevant prior art.**

None known.

**D. General Information**

- a) When did the idea first occur to you and/or the other personnel listed in "B" above?**

Decembar 1, 1998.

- b) When were any sketches or drawings of the idea made and where are they now?**

1/22/99, file XMLforPR.doc  
Personal Engineering Notebook.

- c) Drawing numbers, if any**

None.

- d) When was the first written description of the idea (other than this record) made, and where is it now?**

1/22/99, file XMLforPR.doc, attached to my Engineering Notebook.

- e) If the first description of your idea was oral, to whom was it made, when, and where?**

Not oral.

- f) Has your idea ever been actually used or tested in any way?**

Yes: X

No:

- g) Has your idea, or any drawings, specifications, models, or equipment incorporating it, ever been sold or offered for sale?**

Yes:

No: X

**h) When was the idea first tested or demonstrated?**

Prototype implementation: June-July 99,  
Demonstration: 8/4/99

**i) Where?**

Oki Data Americas, Inc., Engineering, 3B

**j) Who witnessed such test or demonstration?**

Bill Kristich, Tim O'Shea, C.S.Murali, Roman Orzol, Jim Fuchs, Arnie Peters

**k) Where is the model that you tested?**

Computer "Dragan", ODA SW ENG

**l) Attach photographs (if any) of the model**


NA

**Please sign and date this form below, and if possible, have two (2) witnesses who understand the idea also sign it as indicated. Do the same for each sheet attached to this form**

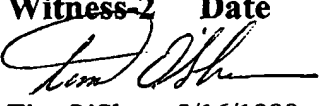
**Witness-1      Date**

  
Bill Kristich, 8/16/1999

**Discloser      Date**

  
Dragan Sretenovic, 8/16/1999

**Witness-2      Date**

  
Tim O'Shea, 8/16/1999

## **Patent disclosure #137**

Suggested name:

**Universal Dynamically Updateable Network Device Monitoring System using XML**

Author:

**Dragan Sretenovic**

Last update:

**4/19/2000**

### **Purpose of the System**

Proposed software is for monitoring and configuration of devices like printers, connected to network or computer. The system is universal because:

- it can communicate using any available protocol
- it can communicate with any device model, as long as it can find description
- it can generate user interface in any supported human language
- it can automatically update itself by downloading new descriptions from Internet

### **The Concept**

Devices like printers are typically described by configuration variables in form NAME=VALUE. Different system protocols and languages can be used for this communication, like SNMP, PJP, HTTP. The system communicates with human using dynamically generated user interface by "translating" from system language to human language. System can support new device model by automatic updating translation dictionary.

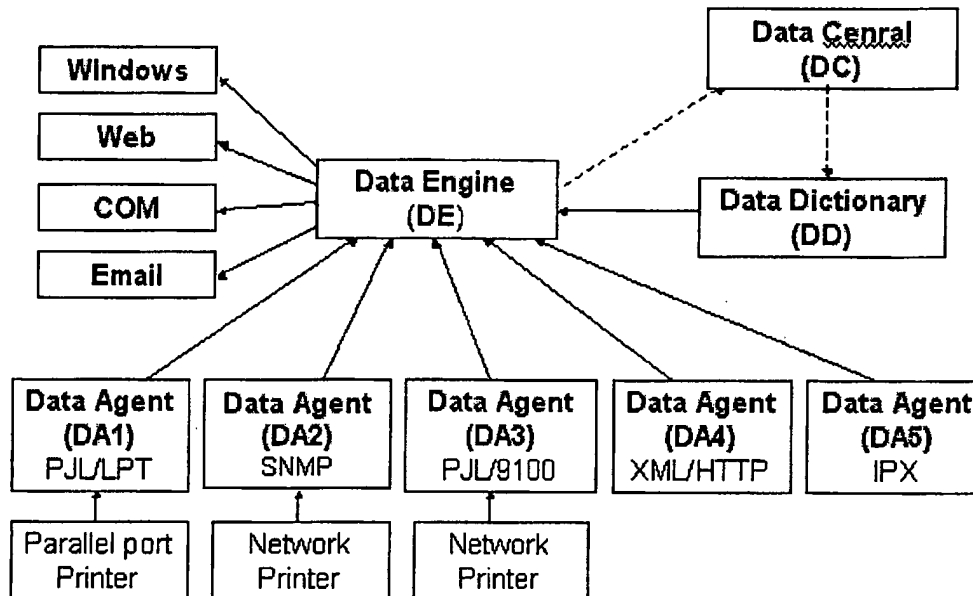
### **Example**

Printer has characteristic named "Paper tray source" in English language.

The same is described by SNMP object-variable "1.3.6.1.4.1.2001.1.1.1.1.40" and PJP variable "OKIPAPERFEED". In all cases current value is for example "TRAY1".

System communicates with devices using for example SNMP language and gets 1.3.6.1.4.1.2001.1.1.1.1.40 = TRAY1. The system translates this in selected human language, for example English, and dynamically generates user interface, like Web or Windows form.

## System Architecture



### How does the system works?

**Data agent** is software module that communicates with device using specific system protocol and language, like SNMP, PJP etc. It provides data in form of NAME=VALUE arrays. The communication can be bi-directional, which allows changing configuration of the device. Besides NAME and VALUE, Data Agent can provide additional flags like READONLY, and list of allowed values, if available from device.

**Data Engine** is software module that gets variables in system language from selected Data Agent, and translates it in selected human language. Based on this result, proper user interface is dynamically generated, like Windows, Web, Email etc.

**Data Dictionary** provides "translations" between system and human languages for DE. For example:

Key	Language	Name
15	SNMP	"1.3.6.1.4.1.2001.1.1.1.1.40
15	PJP	OKIPAPERFEED
15	English	Paper tray source
15	French	Source de magasin

Data Dictionary can be in XML format.

**Data Central** is Internet web site where updated for Data Dictionary can be obtained.

### Dynamic update of Data dictionary

When Data Engine detects new variable or device unknown in Data Dictionary, it can initiate update of Data Dictionary from Data Central, by downloading new "translations" in XML format over HTTP protocol.



## Conclusion

Proposed system has multiple advantages over conventional network devices monitoring systems because it is **universal and dynamically updateable**

- The same program can communicate using any system protocol if adequate plug-in Data Agent is provided
- The same program can generate user interface in any human language, if adequate translation is available from DD or DC
- When new device or characteristic is discovered, system automatically updates itself by downloading update from DC.

## Appendix:

Example of XML formatted data from **Data Dictionary** or **Data Central**:

```
<?xml version="1.0"?>
<VARIABLES>
  <VARIABLE KEY="15">
    <NAME LANGUAGE="SNMP" VALUE="1.3.6.1.4.1.2001.1.1.1.1.1.40"/>
    <NAME LANGUAGE="PJI" VALUE="OKIPAPERFEED"/>
    <NAME LANGUAGE="English" VALUE="Paper tray source"/>
    <NAME LANGUAGE="French" VALUE="Source de magasin"/>
  </VARIABLE>
</VARIABLES>
```

Example of XML formatted data from **Data Agent**:

```
<?xml version="1.0"?>
<VARIABLES LANGUAGE="PJI">
  <VARIABLE NAME="DISPLAY" VALUE="ON-LINE"/>
  <VARIABLE NAME="PERSONALITY" VALUE="AUTO"
    OPTIONS="ENUMERATED">
    <OPTION VALUE="PCL"/>
    <OPTION VALUE="IBMPPR"/>
    <OPTION VALUE="EPSONFX"/>
    <OPTION VALUE="AUTO"/>
  </VARIABLE>
  <VARIABLE NAME="OKIPAPERFEED" VALUE="TRAY1">
    <OPTION VALUE="TRAY1"/>
    <OPTION VALUE="FRONTTRAY"/>
  </VARIABLE>
  <VARIABLE NAME="OKIAUTOTRAYSWITCH" VALUE="OFF">
    <OPTION VALUE="OFF"/>
    <OPTION VALUE="ON"/>
  </VARIABLE>
</VARIABLES>
```

**Best Available Copy**